

**ARCHAEA
ENERGY**

Renewable Energy.
Redefined.

**PROJECT ASSAI
DEP-EPA MEETING
MARCH 2022**

Presentation Outline

- 1) Presentation objectives: Introductions to people we haven't met (and establish new points of contact), inform everyone of who we are, and our current progress.
- 2) What does Archaea Energy do?
- 3) Why is our carbon capture story the best one out there?
- 4) Project Assai

Ex. 4 CBI

Archaea Carbon Capture Team



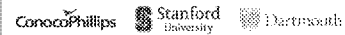
Rob Glaser, VP of Geology/CCSU

- 20+ years of experience in exploration and production, multiple U.S. basins
- MS in Petroleum Geology from the University of Louisiana, Lafayette



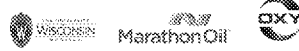
Blair Chan, Geologic Advisor

- 8+ years experience in US & Global Exploration and Basin Modeling
- Doctorate in Sedimentary Basin Analysis



Andrew Trzaskus, Geologic Advisor

- 11+ years of experience
- Nationwide subsurface knowledge as independent geologist
- MS in Geology



Chris O'Connor, Land Manager

- 17+ years of experience
- Certified Petroleum Landman
- BA from University of Texas at Austin



Bill Feille, Geologic Advisor

- 20+ years of experience in field development
- BS in Geology from Stephen F. Austin State University



Casey McDonough, Drilling Engineer (Contract)

- 25+ years of experience drilling multiple basins (U.S./Int'l)
- BS Engineering, Oklahoma University



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Archaea Geology & Carbon Capture Team Continued....

- Since the headshot slide was created, we have added more key personnel....
 - Dan Pignatiello, Consulting Petrophysicist
 - David Moreno, Full-time Reservoir Engineer
 - Jayme Wollison, Consulting Facilities & Compression Engineer
 - Tim Curry, Consulting Reservoir Engineer
 - Business Development Lead -- To Be Announced



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Archaea Energy, Inc.

What We Do....

- Renewable Natural Gas (RNG) is the foundation of Archaea Energy's business model with world class expertise in gas separation technology, project development, and engineering.
- In 2021, Rice Acquisition Corp., a publicly traded special acquisition company, combined with Archaea Energy LLC and Aria Energy LLC to form Archaea Energy, Inc. (NYSE symbol – "LFG"), one of the largest RNG companies in North America with a market cap of \$2.5B.
- The company has dual headquarters: Canonsburg, PA and Houston, TX with particularly strong roots in the Appalachian Basin.
- Archaea operates numerous gas processing facilities with RNG-offtake agreements and long-term delivery contracts throughout the United States.

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Carbon Capture and Sequestration (CC&S)

Archaea has the potential to be an emerging leader in the execution of US CC&S projects...

CC&S Overview

Why Invest in Carbon Capture and Sequestration

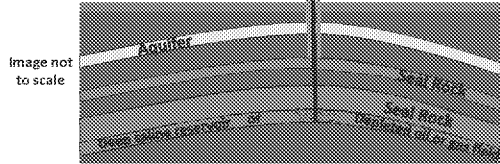
- CC&S is critical to greenhouse gas reductions and net zero carbon goals
- US has bipartisan support for continued and increasing investment in geologic carbon storage
- It makes Archaea a better neighbor and partner

How Carbon Capture and Sequestration Works

1. Carbon dioxide is captured and purified from landfill gas



2. Carbon dioxide is compressed and injected into deep geologic reservoirs



3. Carbon dioxide remains permanently trapped underground



Benefits of CC&S for Archaea

Improve RNG Project Economics

Reduces Carbon Intensity Score, more than doubling the price of our RNG (good for the environment, our partners, AND us)
45Q Tax Credit provides \$50/ton of CO2 in geologic storage with talks over increased credit (\$80/ton?) underway in the U.S. legislature

ESG Mission & Commitments

Empowers our partners to meet their mandated and voluntary decarbonization targets
Reduces emissions to achieve net zero or negative carbon intensity scores for our products
Unlike other CO2 sources, landfill CC&S decarbonizes the inevitable emission of GHGs in a win-win scenario that benefits ALL stakeholders

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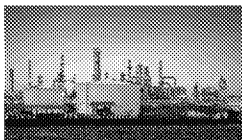
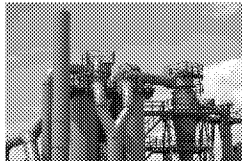
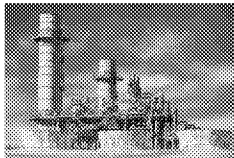
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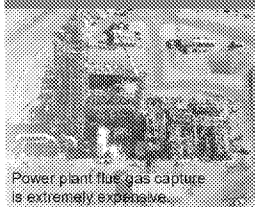
What Is Required To Perform Carbon Capture and Sequestration?

A Stationary, Concentrated Source of Carbon Dioxide

- Facilities such as electrical power plants, cement and lime kilns, gas processing plants, oil refineries, chemical and plastic plants, ethanol distilleries, and many other industries that use natural gas for heat or power are ideal sources of CO₂ waste streams.

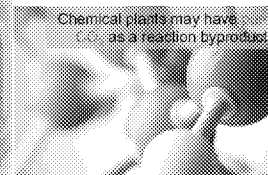


Sources Vary in Capture Suitability and Feasibility



Power plant flue gas capture is extremely expensive.

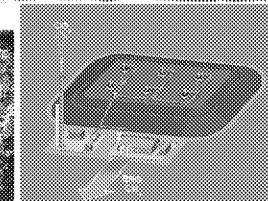
CO₂ capture facility at Fort Belvill, Illinois, a source of natural gas.



Chemical plants may have pure CO₂ as a reaction byproduct.



Home heating emissions are distributed and intermittent.



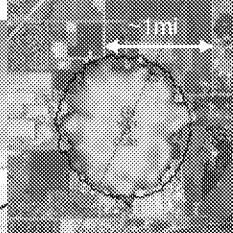
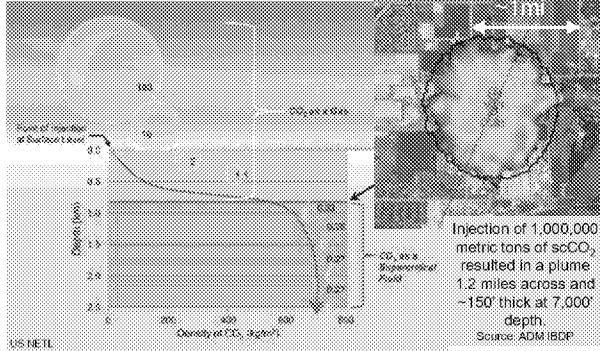
Archaea RNG plants produce steady, concentrated CO₂ streams.

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What Is Required To Perform Carbon Capture and Sequestration?

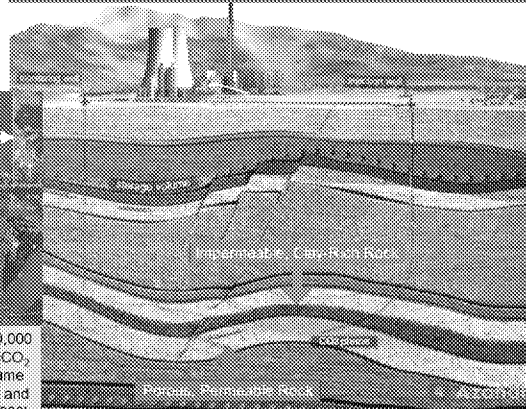
Enough of the Right Sedimentary Rocks, Specifically

- Compressing CO₂ into a supercritical fluid results in a greater than 300x reduction in volume.
- Rocks at least 3,000' deep have enough hydrostatic pressure in their pore fluids to keep CO₂ in this supercritical state, allowing it to occupy the smallest volume possible.



Injection of 1,000,000 metric tons of scCO₂ resulted in a plume 1.2 miles across and ~150' thick at 7,000' depth.
Source: ADM IRDP

CC&S Requires Reservoir Rock and Sealing Rocks in the Right Sequence



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What Is Required To Perform Carbon Capture and Sequestration?

US Environmental Protection Agency UIC Class VI Permit

- EPA's stated purpose for UIC Permitting is to protect Underground Sources of Drinking Water (USDW), which are aquifers having 10,000 ppm Total Dissolved Solids or less. The ocean is >35,000 ppm for reference, and our target injection zones may be even higher than that.
- CO₂, whether gas, liquid or supercritical liquid, is buoyant with regards to the saline aquifers. Therefore, leakage of CO₂ or formation fluids will be detectable in groundwater before migration into soils or the atmosphere. This makes it the natural choice for first-line regular monitoring.
- Due to recent experience in Oklahoma, prevention of earthquakes induced by fluid injection into the deep subsurface has also become a concern to the EPA.
- The EPA has an online permit submission system, the Geologic Storage Data Tool, to outline and organize all the required information and reports.
- *Each injection well requires a Class VI permit application, with all required steps.*
- Has been mentioned to us that it is more of a negotiation than a checklist, at least in this early stage of project development.

Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO₂) Geologic Sequestration (GS) Wells Final Rule

On this page:

- Rule Summary
- Rule History

Rule Summary

On March 30, 2015, EPA issued a rule that established a new regulatory site class. The Class VI site is established to protect underground sources of drinking water from injecting carbon dioxide storage of carbon dioxide (CO₂). The specific criteria covered by the Class VI rule include:

- Permitting
 - Geologic characterization
 - Area of review (AOR) and volume of review
 - Fluids and injectivity
- Well construction
 - Reduction in permeability (RIP)
 - Monitoring
- Well plugging
- Final report and site closure
- Stewardship

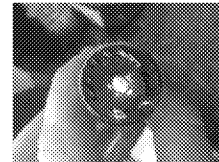
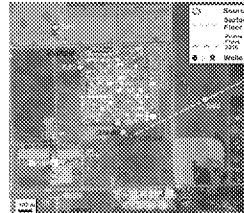
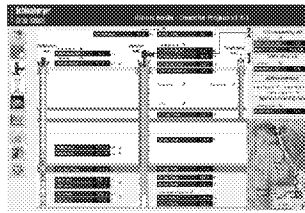
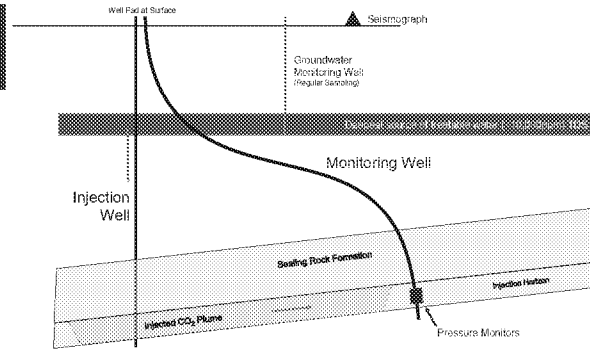
Federal Register Citations	
• 40 CFR 147.102	
Code of Federal Regulations Citations	
• 40 CFR Part 147	
• 40 CFR Part 147	
• 40 CFR Part 147	
• 40 CFR Part 147	
• 40 CFR Part 147	
Document Numbers	
• 603.152.000.0000	
• 603.152.000.0000	
Effective Date	
• September 21, 2015	

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What Is Required To Perform Carbon Capture and Sequestration?

Other Requirements, Both Tangible and Intangible

- Partners willing and able to cooperate with us to achieve CC&S goals.
- Enough open land for injection and monitoring wells and compression equipment within a reasonable distance of the gas plant.
- Public outreach to introduce projects to the local community and gain awareness and acceptance prior to formal EPA Public Comment Period.
- Permits other than the EPA Class VI Permit to Inject. These will vary based on the city, county, and states the projects are in, but preliminary efforts have shown the amount will vary from "a lot" to "more than you ever thought possible".



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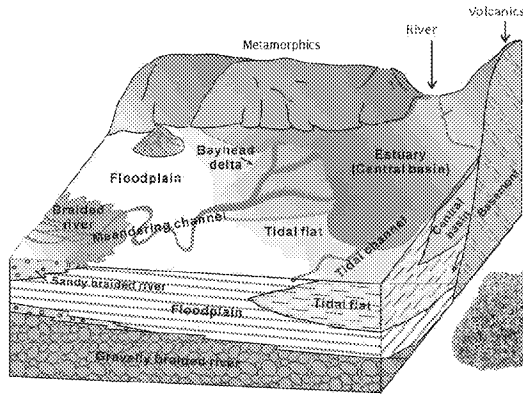
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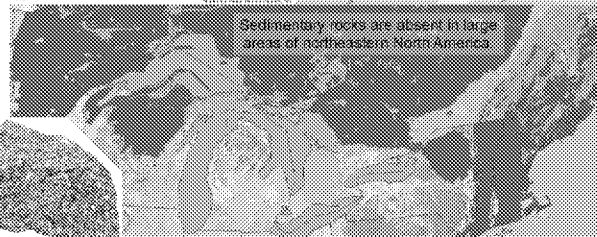
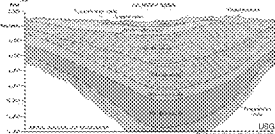
What Is Required To Perform Carbon Capture and Sequestration?

Sedimentary Rocks, In General

- Sedimentary rock is formed of rock grains transported and deposited by water and wind. The space between these grains makes the rock porous and able to hold water (fresh or saline), oil, gas, and CO₂.
- Volcanic and Metamorphic rocks typically lack these pore networks.



Sedimentary basins are where thick accumulations of sedimentary rock have been deposited and are focus areas for CC&S.



45Q Background

Goal of 45Q is to incentivize investment in carbon capture and storage projects

- 2008 -- 45Q is enacted, originally providing \$10/ton of CO₂ stored via Enhanced Oil Recovery and \$20/ton stored in geologic formations
- 2018 -- 45Q is reformed as part of the Bipartisan Budget Act
 - Broadens eligibility by lowering the annual CO₂ capture minimum
 - Expands CO₂ to cover carbon dioxide and carbon oxide
 - Increases the value of credits (up to \$35/ton for Enhanced Oil Recovery and \$50/ton for stored in geologic formations)
 - Provides greater flexibility for entities to claim the credit
 - Eliminates the limits on overall credits in the market
 - Clarifies how long credits will be available (12 years)
- December 27, 2020 -- Trump signs the Taxpayer Certainty and Disaster Tax Relief Act of 2020 ("Extenders Bill")
 - Extends 45Q by two more years to projects that begin construction prior to January 1, 2026

<https://www.eia.doe.gov/energyinfrastructure/energyefficiency/energyefficiency.cfm?topic=45Q>
Beck, 2020, Global CCS Institute, Brief – The US Section 45Q Tax Credit for Carbon Dioxide Sequestration: An Update
<https://www.globalccsinstitute.com/resources/updates/2020/04/01/45q-brief-to-congress-110001>

Methods for Carbon Oxide Removal or Reduction

Geologic Storage (non-Tertiary Injectant)

Includes (but not limited to) storage of carbon oxide in deep saline formations, oil and gas reservoirs, and unminable coal seams

Geologic Storage (Tertiary Injectant)

Uses carbon oxide as an injectant in an oil or natural gas reservoir to significantly increase the amount of petroleum recovered

Utilization

- *The fixation of carbon oxide through photosynthesis or chemosynthesis, such as through growing of algae or bacteria*
- *The chemical conversion to a material or chemical compound in which carbon oxide is securely stored*
- *The use of carbon oxide for purposes where a commercial market exists*

Geologic Storage Requirements

Geologic Storage Requirements (non-Tertiary Injectant)

- Complies with EPA Underground Injection Control (i.e., permitted Class VI well)
- Complies with reporting of greenhouse gases to the EPA under 40 CFR Subpart RR (Geological Sequestration of Carbon Dioxide)

Geologic Storage Requirements (Tertiary Injectant)

- Complies with EPA Underground Injection Control (i.e., permitted Class II well)
- Certified by a petroleum engineer that:
 - Project involves tertiary recovery method
 - Describes implementation and operation
 - Provides data on production history and recovery enhancements
 - Delineates the reservoir
- Operator submits continued project certification annually
- Certifies volumes permanently stored
- Complies with reporting of greenhouse gases to the EPA under 40 CFR Subpart RR (Geological Sequestration of Carbon Dioxide)

Utilization Requirements

Utilization of Qualified Carbon Oxide

- Based on lifecycle greenhouse gas emissions (GHG) and lifecycle analysis (LCA), carbon oxide utilized is the amount:
 - Captured and permanently isolated from the atmosphere
 - Displaced from being emitted into the atmosphere (i.e., captured carbon oxide is utilized instead of non-captured carbon oxide, resulting in net lower carbon oxide)
- Taxpayer verifies amount of qualified carbon oxide demonstrated by net reduction
- A 3rd party either performs or verifies the LCA report
- The Department of Energy conducts a technical review of the LCA report

How does Lifecycle Greenhouse Gas Emissions and Lifecycle Analysis Work (LCA)?

LCA calculates the aggregate quantity of GHG emissions (including direct and indirect, like land-use changes) related to the full product lifecycle where the mass values for all GHGs are adjusted to account for their relative global warming potential (CO₂e). It includes all stages of the product (from generation/extraction to distribution/delivery to use of the finished product).

Qualified Facilities

Qualified Facilities include Industrial Facilities (that produces a carbon oxide stream from combustion or manufacturing, or a carbon oxide emission that would otherwise be released into the atmosphere) or Direct Air Capture Facilities whose construction and/or original planning for capture equipment begins before January 1, 2026

REQUIREMENTS		
Utilization	Electricity Generating Facilities	Direct Air Capture and Non-Electricity Generating Facilities
<ul style="list-style-type: none">• For Facilities (other than Direct Air Capture) that emit less than 500,000 tons of carbon oxide• Must capture and utilize more than 25,000 tons of carbon oxide during the taxable year	<ul style="list-style-type: none">• Must capture more than 500,000 tons of carbon oxide	<ul style="list-style-type: none">• Must capture more than 100,000 tons of carbon oxide

Other Useful Definitions...

Qualified carbon oxide -- any carbon dioxide or other carbon oxide that would otherwise have been released into the atmosphere, is measured at the source of capture and verified at point of disposal/injection/utilization (does not include recycled carbon oxide as part of Enhanced Oil Recovery)

Carbon capture equipment -- components used to capture or process carbon oxide (NOT transporting/disposing/injecting/utilizing) including separating, purifying drying, and/or compressing carbon oxide otherwise released into the atmosphere, removing via direct air capture, and compressing

Combining Qualified Facilities to Meet Requirements

Notice 2020-12, Section 8.01

Multiple qualified facilities or units of carbon capture equipment that operate as a single project may be treated as a single qualified facility. Determining factors include:

- ✓ Ownership by a single entity
- ✓ Constructed in the same general geographic location or contiguous pieces of land
- ✓ A single system of gathering lines or single off-take operation is used to collect and deliver carbon oxide
- ✓ Captured carbon oxide is disposed/utilized/injected as part of a shared contract
- ✓ The qualified facilities are described in one or more common environmental or other regulatory permits or are required to collectively report their activities
- ✓ Qualified facilities were constructed pursuant to a single contract providing Front-End Engineering and Design or similar services covering the full scope of the single project
- ✓ Qualified facilities were constructed pursuant to a single master construction contract
- ✓ Qualified facilities were financed as part of the same loan agreement

Tax Credit Schedule

Eligibility for tax credit occurs over a 12 year period from the date carbon capture equipment was first placed in service

Geologic Storage Schedule	
Year	\$/ton Carbon Oxide
2021	34.81
2022	37.85
2023	40.89
2024	43.92
2025	46.96
2026	50.00

After 2026, \$/ton = \$50 * inflation adjustment factor for the calendar year

Tertiary Injectant/Utilization Schedule	
Year	\$/ton Carbon Oxide
2021	22.68
2022	25.15
2023	27.61
2024	30.74
2025	32.54
2026	35.00

After 2026, \$/ton = \$35 * inflation adjustment factor for the calendar year

Taxpayers, Contractors, and Subcontractors – Distributing the Credit

The Tax Payer / Credit Claimant is identified as...

Prior to Feb 9, 2018

The person that captures and physically or contractually ensures carbon oxide's disposal/injection/utilization (contractually ensuring capture not eligible)

Post Feb 9, 2018

The person that owns the carbon capture equipment (per single process train) and physically or contractually ensures the capture/disposal/injection/utilization of carbon oxide

CONTRACTORS AND SUBCONTRACTORS

- Taxpayer may enter into **BINDING WRITTEN CONTRACTS** with contractors (enforceable under State Law with no specified limit to damages)
- Contractors may enter into similar **BINDING WRITTEN CONTRACTS** with sub-contractors
 - Contracts must be reported to the IRS
 - Contracts must be commercially reasonable terms and provide for enforcement of the contractor's CCS obligation
 - In case of a leak, contractors must promptly inform the capturing party with all information pertinent to recapture
- Taxpayer **MAY ELECT TO GIVE FULL OR PARTIAL TAX CREDIT** to a contractor (but not subcontractor) that disposes, injects, or utilizes the carbon oxide and obtains relevant permits
- Taxpayer may not elect to give tax credits to a contractor that physically captures carbon oxide
- Election to give a full or partial tax credit to a subcontractor must be elected annually

How to repurpose older facilities to achieve new facility status

For facilities in service prior to February 9, 2018, facilities may add or modify capture equipment to achieve partial or full post-February 9, 2018 tax credits

Additional Carbon Capture Equipment

- A physical modification or equipment addition resulting in increased carbon oxide capture constitutes the installation of additional equipment
 - Tax credits will be portioned between the pre and post Feb 9, 2018 code based on the relative amounts of additional capture

New Carbon Capture Equipment

- A physical modification or equipment that satisfies the 80/20 rule (new equipment >80% of total value) constitutes installation of new equipment
 - Tax credits are applied completely to the post-Feb 9, 2018 code
- Retrofitted qualified facilities -- if value of used components for an independently functioning processing train and/or pipeline is <20% of the total value of the facility (80/20 Rule), it qualifies as a new facility

Rules around Recapture Events

In the event claimed carbon oxide escapes from geologic storage...

- Only considered a recapture event if the leaked amount of qualified carbon oxide exceeds the amount of qualified stored carbon oxide that same taxable year (otherwise, the taxable year's credit = carbon oxide stored -- leaked amount)
- Must quantify the leak and certify the amount by an independent engineer or geologist
- Tax payer/credit claimant not liable due to loss of containment from actions unrelated to the selection, operation, or maintenance of the storage facility, such as volcanic activity or a terrorist attack

Paying for Recapture

- Recapture taxes due: (Leaked amount -- stored amount) * credit rate
- Recapture period: From date of first injection to earlier of 3 years after the last 45Q credit was claimed
- Recapture amounts are calculated on a first-in-first-out basis (recapture amounts will go against the current taxable year first, then the previous year, then the year before that), and, given changes in ownership, whomever collected the credit from that year is held accountable
- If leaked carbon oxide is from multiple units of carbon capture equipment under multiple owners, the amount will be allocated on a pro rata basis